

Our Reference No. 3244-126

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: )  
Zhang, Zheng et al. )  
Serial No. 10/814,123 ) Group No.: 1712  
Filed: April 4, 2004 ) Examiner: Kuo Liang Peng  
For: Protein Compatible Methods and )  
Compounds for Controlling the )  
Morphology and Shrinkage of Silica )  
Derived from Polyol-Modified Silanes )

**DECLARATION UNDER 37 C.F.R. 1.132**

Honourable Assistant Commissioner  
For Patents  
Washington, D.C. 20231

Dear Sir:

I, Jorge Cervantes Jáuregui, citizen of Mexico and resident of Guanajuato, Mexico declare that the following facts are within my knowledge and are true.

1. I am a Professor in the Chemistry Department at the UNIVERSIDAD DE GUANAJUATO in Guanajuato, Mexico.
2. I have reviewed the Journal Abstract entitled "The biporous structure of monolithic silica columns containing entrapped proteins" submitted by Zheng Zhang and Michael A. Brook for presentation at Guanajuato, Mexico, August

2002 at the XIIIth International Symposium on Organosilicon Chemistry, attached herewith as Exhibit A.

3. I acted as Conference Chairperson for XIIIth International Symposium on Organosilicon Chemistry.

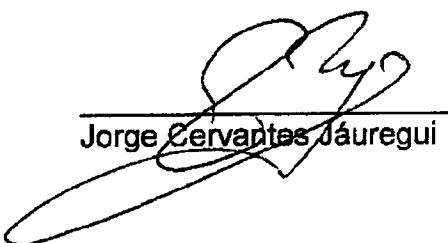
4. In my capacity as Conference Chairperson I had knowledge of when the abstracts for XIIIth International Symposium on Organosilicon Chemistry were released to the public.

5. I confirm that the Abstracts for XIIIth International Symposium on Organosilicon Chemistry, Guanajuato, Mexico, August 2002, including the Abstract in Exhibit A, were made available to the public on August 25, 2002.

6. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and, further, that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such a wilful false statement may jeopardize the validity of the application or any patent issuing thereon.

April 17, 2007  
Date

Jorge Cervantes Jáuregui



# Exhibit "A"

## THE BIPOROUS STRUCTURE OF MONOLITHIC SILICA COLUMNS CONTAINING ENTRAPPED PROTEINS

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Controlled morphology silicas are of interest for a variety of applications including as catalysts and biosensors. Our current goal is to incorporate proteins, in stable form for several months, into silica to create a chromatographic support.

Macro- and meso-porous silica was formed by a sol-gel process. Rather than  $\text{Si(OEt)}_4$ , silanes derived from glycerol, sorbitol, maltose and dextrans were used as starting materials. Upon hydrolysis, these compounds generate monolithic silica structures of low porosity, which are very compatible with proteins. Addition of polyethylene oxide polymers completely changed the cure profile. Shortly after mixing two homogeneous aqueous solutions, a bicontinuous structure was formed by gelation after spinodal phase-separation. The resulting monolith showed a biporous structure with both macropores and mesopores as observed by SEM and TEM, respectively. The controlled synthesis of protein-containing versions of these monoliths and their chromatographic behaviour will be described.